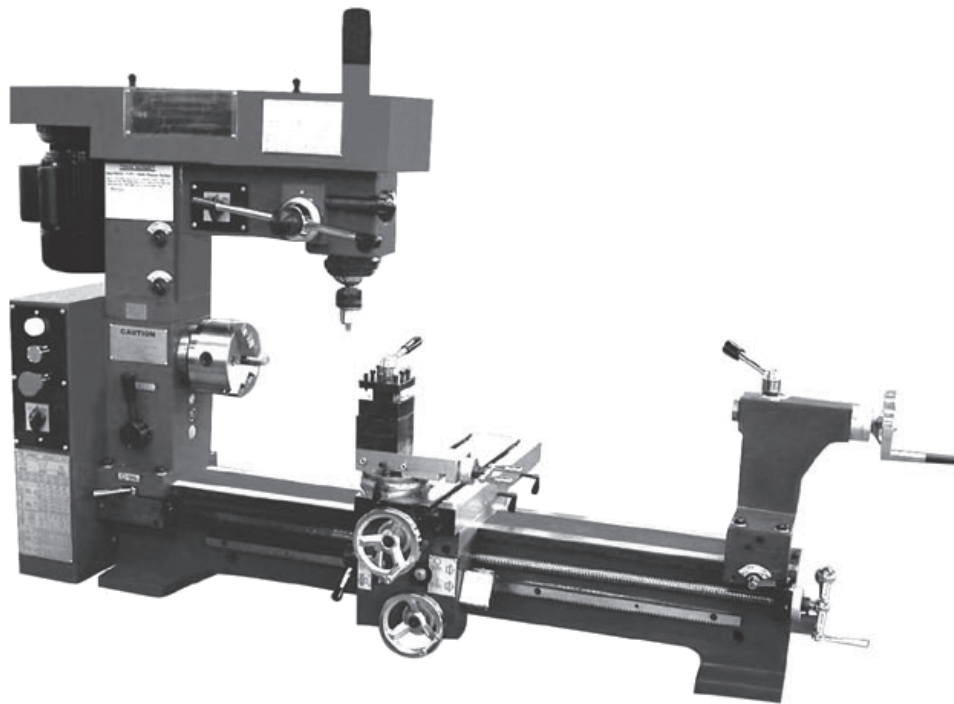


# **CENTRAL MACHINERY<sup>®</sup>**

# **3-IN-1 MULTI-PURPOSE MACHINE**

## **Model 44142**

### **ASSEMBLY AND OPERATING INFORMATION**



Due to continuing improvements, actual product may differ slightly from the product described herein.



3491 Mission Oaks Blvd., Camarillo, CA 93011

Visit our Web site at <http://www.harborfreight.com>

**TO PREVENT SERIOUS INJURY,  
READ AND UNDERSTAND ALL WARNINGS  
AND INSTRUCTIONS BEFORE USE.**

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**For technical questions and replacement parts, please call 1-800-444-3353.**

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## SPECIFICATIONS

| ITEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Cast Iron/Machined Steel                                                                                                                                                                                                                                                                                                                                                                                              |
| Weight                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 507 Lbs.                                                                                                                                                                                                                                                                                                                                                                                                              |
| Overall Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 62" x 24" x 39"                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b><i>Lathe Specifications:</i></b><br>Spindle Bore<br>Spindle Length<br>Spindle Taper<br>Lathe Chuck Diameter<br>Lathe Chuck Runout<br>Swing Over Bed<br>Swing Over Cross Slide<br>Center to Center<br>Carriage Travel<br>Cross Slide Travel<br>Cross Slide Scale<br>Tool Slide Travel<br>Tool Slide Scale<br>Tailstock Quill Travel<br>Tailstock Quill Taper<br>Tailstock Quill Lock<br>Tailstock Scale<br>Tailstock Center<br>Thread Indicator<br>Tool Post/Holder Capacity<br>Tool Post Style<br>Tool Post Mounting Hole<br>Tool Post Mounting Stud<br>Tool Post Angle<br>Tool Post Rotation<br>Bed Ways Length<br>Bed Ways Width<br>Height of Bed<br>Chuck Center Height<br>Available Threads | 1"<br>13-1/2" From Chuck to Spindle End<br>MT-4<br>5"<br>0.005"<br>16.5"<br>6"<br>31-1/2"<br>18.1"<br>7.8"<br>0.002"<br>4"<br>0.002"<br>3"<br>MT2<br>Equipped<br>0.001"<br>Dead<br>Equipped<br>1/4"min./1/2"max.<br>Rotating Square - 4 Way<br>9/16" (12MM)<br>5/8" (14MM)<br>90°<br>360° Counterclockwise<br>27-3/4"<br>5-3/8"<br>8-1/2" From Base<br>13" From Base<br>Inches-TPI: 8,9,10,11,12,14,16,18,20,24,32,40 |
| <b><i>Drill/Mill Specifications:</i></b><br>Mill Spindle Taper<br>Spindle Travel<br>Spindle to Column<br>Nose to Table<br>End Mill Capacity<br>Chuck Taper<br>Drill Chuck Key<br>Table Size<br>Drill Capacity<br>Draw Bolt Thread<br>Overall Height<br>Overall Length<br>Overall Width<br>Gearbox<br>Forward/Reverse                                                                                                                                                                                                                                                                                                                                                                               | R8<br>4.3"<br>11.2"<br>12"<br>1"<br>JT33<br>Standard Key<br>18-5/8" x 6-1/4"<br>.8"<br>13/16" x 1.60 (19MM x 1.60)<br>37.5"<br>50"<br>8.8"<br>All Speeds Changed by Belt/Gear<br>Drill/Mill                                                                                                                                                                                                                           |

## SPECIFICATIONS (continued)

| ITEM                                                                                                  | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum Tool Size<br>Motor RPM<br>Motor HP<br>Voltage<br>Cord/Switch/Plug<br>Cord Length<br>Plug Type | 1/2" x 1/2" Square<br>1700<br>3/4<br>110 V Single Phase<br>UL/CE/CSA Approved<br>6 Ft.<br>3-Pole                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Accessories:</b>                                                                                   | 5.5-7 mm Open End Wrench<br>8-10 mm Open End Wrench<br>13-16 mm Open End Wrench<br>14-17 mm Open End Wrench<br>17-19 mm Open End Wrench<br>24 Gear<br>27 Gear<br>30 Gear<br>33 Gear<br>36 Gear<br>39 Gear<br>42 Gear<br>48 Gear<br>60 Gear<br>72 Gear<br>120/127 Gear<br>Dead Centers: MT2 & MT4<br>L-Hex Wrenches: 3/16", 5/16", 7/32", 1/4" (3,4,5,6 MM)<br>Drill Chuck Key<br>Lathe Chuck Wrench<br>Tool Holder Wrench<br>Outside Jaws (1 Set)<br>Instruction Manual<br>1/2" JT33 Chuck<br>Center Sleeve R8-MT2<br>Slotted (-) Screwdrivers 100 x 6mm<br>Wedge |

## SAVE THIS MANUAL

**You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.**

## GENERAL SAFETY WARNINGS AND PRECAUTIONS

- KEEP WORK AREA CLEAN AND DRY.** Cluttered, damp or wet work areas invite injuries.
- KEEP CHILDREN AWAY FROM WORK AREA.** Do not allow children to handle this machine.
- STORE IDLE EQUIPMENT.** When not in use, tools and equipment should be stored in a dry location to inhibit rust. Always lock up tools and equipment and keep out of reach of children.

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4. **DO NOT USE THIS PRODUCT IF UNDER THE INFLUENCE OF ALCOHOL OR DRUGS.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not attempt to use this machine.
5. **USE EYE, HEARING, AND BREATHING PROTECTION.** Wear ANSI-approved safety impact eye glasses, ANSI-approved hearing protection, and ANSI-approved dust protection when working with this machine. ANSI-approved safety impact eye glasses, hearing protectors, and dust masks are available from Harbor Freight Tools.
6. **DRESS SAFELY.** Nonskid footwear or safety shoes should be used when working with this machine. Do not wear loose clothing or jewelry as they can become caught in moving parts. Wear a protective hair covering to prevent long hair from becoming caught in moving parts. If wearing a long-sleeve shirt, roll sleeves up above elbows.
7. **INDUSTRIAL APPLICATIONS MUST FOLLOW OSHA REQUIREMENTS.**
8. **DO NOT OVERREACH.** Keep proper footing and balance at all times to prevent tripping, falling, back injury, etcetera.
9. **STAY ALERT.** Watch what you are doing at all times. Use common sense. Do not use this machine when you are tired or distracted from the job at hand.
10. **CHECK FOR DAMAGED PARTS.** Before using this machine, carefully check that it will operate properly and perform its intended function. Check for damaged parts and any other conditions that may affect the operation of this machine. Replace or repair damaged or worn parts immediately.
11. **REPLACEMENT PARTS AND ACCESSORIES.** When servicing, use only identical replacement parts. Only use accessories intended for use with this machine. Approved accessories are available from Harbor Freight Tools.
12. **MAINTAIN THIS PRODUCT WITH CARE.** Keep this machine clean and dry, and its moving parts well lubricated. Keep drill bits and other cutting accessories clean and sharp for better and safer performance.
13. **MAINTENANCE:** For your safety, service and maintenance should be performed regularly by a qualified technician.
14. **USE THE RIGHT PRODUCT FOR THE RIGHT JOB.** There are certain applications for which this machine was designed. Do not use a small tool, attachment, or machine to do the work of a larger industrial tool, attachment, or machine. Do not use this machine for a purpose for which it was not intended.

## SPECIFIC PRODUCT WARNINGS AND PRECAUTIONS

1. **GROUND THIS MACHINE.** The electrical power cord for this machine is equipped with a grounded 3-prong plug. Never remove the grounding prong or modify the plug in any way. Do not use adapter plugs with this machine. When in use, make sure this machine is always plugged into a grounded 3-hole electrical receptacle.
2. **MAKE SURE THE POWER SWITCH IS IN THE “OFF” POSITION BEFORE PLUGGING IN THE POWER CORD.**
3. **DO NOT ABUSE THE POWER CORD.** Do not use the cord to pull the 3-prong plug from a power outlet. Keep cord away from heat, oil, sharp edges, and moving parts. Replace damaged cord immediately.
4. **KEEP ALL GUARDS IN PLACE, IN WORKING ORDER, AND IN PROPER ADJUSTMENT AND ALIGNMENT.**
5. **REMOVE ADJUSTING KEYS AND WRENCHES.** Make sure all adjusting keys and wrenches are removed from this machine before turning it on.
6. **MAINTAIN A SAFE WORK ENVIRONMENT.** Do not use this machine in or near damp or wet areas. Do not expose this machine to rain. Keep work area well lit. Make sure there is adequate surrounding work space. Do not operate this machine in the presence of flammable liquids, gases, or dust. To avoid accidental electric shock, do not let your body come in contact with grounded surfaces such as pipes, radiators, ranges and refrigerators.
7. **DO NOT FORCE THIS MACHINE.** This machine will do the work better and safer at the speed and capacity for which it was designed.
8. **SECURE THE MATERIAL.** Whenever possible, use clamps or a vise to hold the material when drilling or cutting.
9. **ALWAYS TURN OFF THE MACHINE’S POWER SWITCH AND DISCONNECT THE MACHINE FROM ITS ELECTRICAL SUPPLY SOURCE BEFORE PERFORMING ANY SERVICES OR MAINTENANCE** such as changing drill bits and other cutting accessories, leaving the work area, moving the machine from one location to another, etcetera.
10. **USE CAUTION AS SOME WOODS CONTAIN PRESERVATIVES SUCH AS COPPER CHROMIUM ARSENATE (CCA) WHICH CAN BE TOXIC.** When drilling or cutting such materials, extra care should be taken to avoid inhalation and minimize skin contact.

## UNPACKING

When unpacking, check to make sure all parts shown on the Parts Lists are included. If any parts are missing or broken, please call Harbor Freight Tools at the number shown on the cover of this manual as soon as possible.

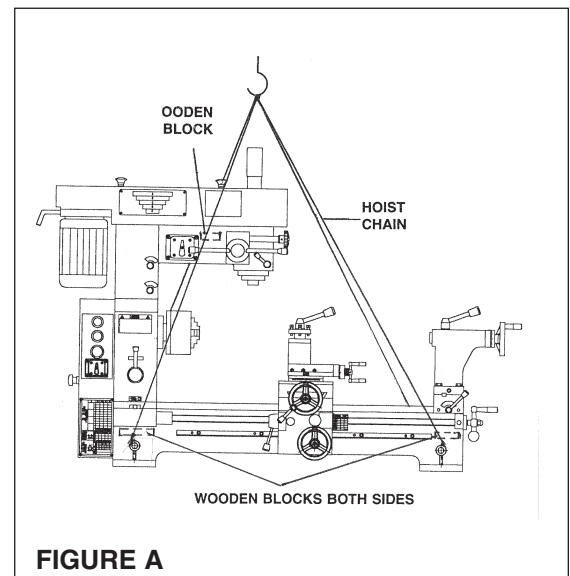
**Prior to shipment by the manufacturer, the Machine is coated with an antirust oil.** You may wish to clean this off before use.

# INSTALLATION INSTRUCTIONS

**NOTE:** All parts below refer to the parts shown on pages 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39 of this manual.

## PREPARING THE FLOOR MOUNTING SURFACE

1. Make sure the floor surface upon which this Machine is to be located is flat, level, and sturdy enough to bear the weight of the machine, its accessories, and the working material.
2. Remove the outer packing/shipping material from the Machine.
3. Remove the four shipping anchor bolts and nuts that attach the Bed (101) of the Machine to the wooden shipping skid/pallet.
4. **Caution:** When lifting the Machine, make sure to use an overhead hoist, or lifting device, and hoist chains having a weight lifting capacity sufficient for the weight of this Machine.
5. Attach the hoist chains securely to both sides of the Machine. **NOTE:** Attach wooden blocks on both sides of the Machine (between the Machine and the hoist chains) to avoid damaging the Machine. (See Figure A.)
6. Slowly and carefully lift the Machine off the wooden shipping skid/pallet, and set the Machine aside on a flat, level, sturdy floor surface.
7. Move the wooden shipping skid/pallet to the floor location where the Machine is to be permanently positioned.
8. Use the four shipping anchor bolt holes in the wooden skid/pallet as a template to mark the holes which will anchor the Machine permanently to the floor.
9. Set aside the wooden shipping skid/pallet after the floor anchor holes have been marked for drilling.
10. Drill into the floor surface the four anchor hole marks (minimum hole size to accept a 1/2" diameter foundation bolt with threads pointing upward.).
11. **NOTE:** The four foundation bolts required to anchor the Machine to the floor surface are not provided. Check with the manufacturer of the foundation bolts for information on how to securely fasten the bolts to the floor surface.



## LEVELING AND ANCHORING THE MACHINE TO THE FLOOR SURFACE

1. Once the four foundation bolts are securely fastened to the floor surface, lift the Machine (see Figure A for instructions) and align the four holes in its Bed (101) with the foundation bolts.
2. Slowly lower the Machine over the foundation bolts and onto the floor surface.
3. Carefully level the width and length of the Machine. If necessary, use the accessory shims provided to raise the end(s) and/or corner(s) of the Machine until it is level.
4. Secure the Machine to the floor surface, by wrench tightening the appropriate size lock washers and nuts onto the foundation bolts (not provided).
5. Remove the hoist chains from the Machine, and set aside the hoist.

## CONTROLS

1. *Caution: Do not operate this machine until you are completely familiar with the control parts and their functions.*  
**(See Figure B.)**
2. Before operating, check to make sure all moving parts are adequately lubricated.  
**(See Figure H, page 15.)**

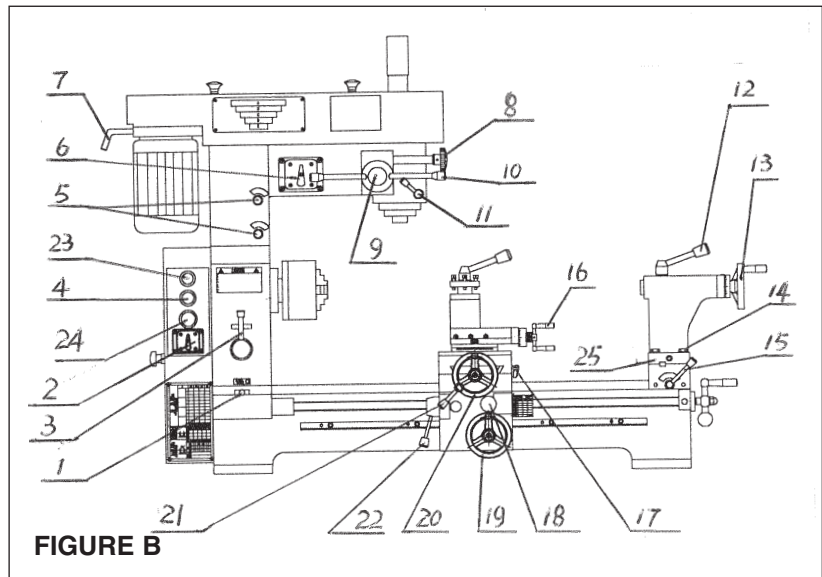


FIGURE B

| Part | Description                                | Part | Description                    |
|------|--------------------------------------------|------|--------------------------------|
| 1    | Lead Screw Lever                           | 14   | Screw                          |
| 2    | Shift Switch                               | 15   | Tailstock Lock Lever           |
| 3    | Change Lever                               | 16   | Tool Post Feed Hand Wheel      |
| 4    | Emergency Switch/RED                       | 17   | Slide Stock Lever              |
| 5    | Drilling/Milling Stock Lock Lever (Wrench) | 18   | Cross Feed Clutch Lever        |
| 6    | Drilling/Milling Shift Switch              | 19   | Longitudinal Feed Hand Wheel   |
| 7    | Drilling/Milling Belt Lock Lever           | 20   | Cross Feed Hand Wheel          |
| 8    | Drilling/Milling Micro Feed Lever          | 21   | Saddle Lock Lever              |
| 9    | Drilling/Milling Micro Feed Clutch Lever   | 22   | Half Nut's Lever               |
| 10   | Drilling/Milling Spindle Feed Lever        | 23   | Pilot                          |
| 11   | Drilling/Milling Spindle Lock Lever        | 24   | Master Switch                  |
| 12   | Tailstock Barrel Lock Lever                | 25   | Returning Screw                |
| 13   | Tailstock Hand Wheel                       | 26   | Main Spindle Pulley Lock Lever |

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# OPERATING INSTRUCTIONS

**NOTE:** All parts below refer to the parts listed on page 8, Figure B of this manual.

## THE CONTROL PANEL SWITCHES

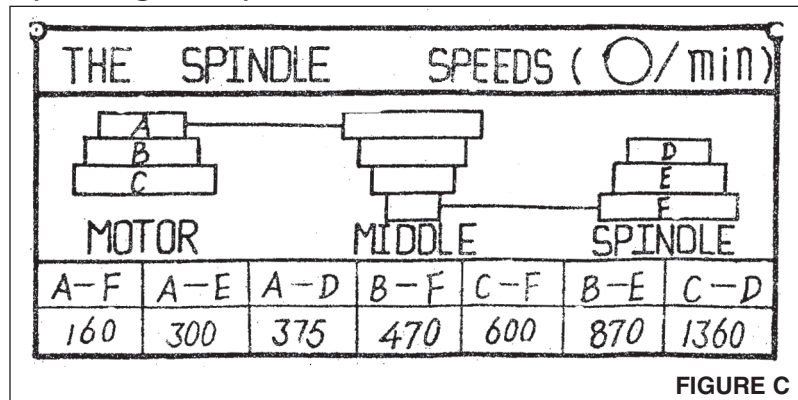
1. The Machine is equipped with the following switches located on its two control panels:
  - a. **Green** Switch (24) to turn on the Machine.
  - b. **Red** Switch (4) to turn off the Machine.
  - c. **Pilot** Switch (23) indicates current is flowing through the Machine's electrical system and the Machine is in its operating mode.
  - d. **Shift** Switch (2) operates the Machine's Main Spindle in either a stop, forward, or reverse direction.
  - e. **Drilling/Milling Shift** Switch (6) operates the Machine's Drilling/Milling Spindle in either a stop, forward, or reverse direction.
2. **NOTE:** When working, if the Machine's control panel doors are opened, the motors of the Machine will automatically shut off.
3. **NOTE:** The machine's motors will automatically shut off or not start, if Part #521, mill-drill cover (upper), is removed on the run or not installed when turning on the machine.

## THE MAIN SPINDLE

1. Before starting the Machine, check the tension of the V-Belt. The V-Belt should depress about 1/2" under normal finger pressure. Too much tension on the V-Belt will burn out the Main Spindle Bearings. The tension of the V-Belt can be adjusted with the Main Spindle Pulley Lock Lever (26).
2. Start the Machine by depressing the Green Switch (24) located on the control panel.
3. Use the Shift Switch (2) to engage the Main Spindle and select either the stop, forward, or reverse running positions. For the stop selection turn the Shift Switch (2) to its middle position. For the forward running selection, turn the Shift Switch (2) to the right. For the reverse running selection, turn the Shift Switch (2) to the left.
4. To change the Main Spindle RPM, turn the Shift Switch (2) to its stop position. Depress the Red Switch (4) to shut off power to the Machine and wait until it comes to a complete stop.

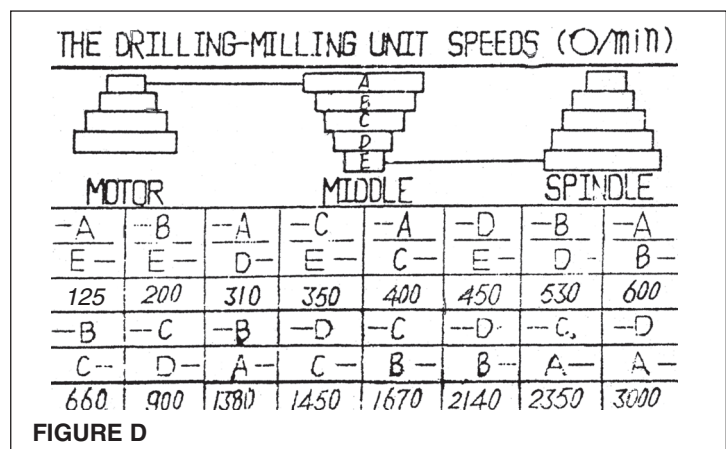
- Release the Main Spindle Pulley Lock Lever (26). Position the V-Belt on the pulleys to obtain the desired Main Spindle RPM. Then, tighten the Main Spindle Pulley Lock Lever (26) to tighten the V-Belt and lock it in place.

**NOTE:** The Main Spindle can obtain 7 different RPM settings by following the chart. (See Figure C.)



### THE DRILLING/MILLING SPINDLE

- Start the Machine by depressing the Green Switch (24) on the control panel.
- Use the Drilling/Milling Shift Switch (6) to engage the Drilling/Milling Spindle and select either the stop, forward, or reverse running positions. For the stop selection turn the Drilling/Milling Shift Switch (6) to its middle position. For the forward running selection, turn the Drilling/Milling Shift Switch (6) to the right. For the reverse running selection, turn the Drilling/Milling Shift Switch (6) to the left.
- The Drilling/Milling Spindle feed depth can be set with the Drilling/Milling Spindle Feed Lever (10)
- To use the micro feeding feature of the Drilling/Milling Spindle, pull out the Drilling/Milling Micro Feed Clutch Lever (9). Then use the Drilling/Milling Micro Feed Lever (8) to obtain the desired feed depth.
- To change the Drilling/Milling Spindle RPM, turn the Drilling/Milling Shift Switch (6) to its stop position. Depress the Red Switch (4) to shut off power to the Machine and wait until it comes to a complete stop.
- Pull back on the Belt Lock Lever (7) to loosen the V-Belt. Position the V-Belt on the pulleys to obtain the desired Drilling/Milling Spindle RPM. Then, push in the Belt Lock Lever (7) to tighten the V-Belt and lock it in place. **NOTE:** The Drilling/Milling Spindle can obtain 16 different RPM settings by following the chart. (See Figure D.)



## THE TAILSTOCK

1. The Tailstock slides along the bed ways horizontally and can be locked in position using the Tailstock Lock Lever (15). The tailstock accepts bits or chucks with a MT2 Shank.
2. The Tailstock Barrel position can be adjusted by unlocking the Tailstock Barrel Lock Lever (12), turning the Tailstock Hand Wheel (13), and re-locking the Barrel Lock Lever (12).
3. To adjust the Tailstock center to cut a small taper, loosen the Screw (14), and adjust the two Returning Screws (25) to make the adjustment between the Drilling/Milling Spindle center and the Tailstock center.
4. To remove a tool from the Tailstock, turn the Handwheel (915) clockwise until the tool is pushed out.

## THE LONGITUDINAL FEED

1. To *hand feed*, turn the Lead Screw Lever (1) to the right. Turn the Half Nut Lever (22) to its clutching position. Hand feed the material by turning the Longitudinal Feed Hand Wheel (19).
2. For *automatic feeding*, turn the Lead Screw Lever (1) to the left. Turn the Half Nut's Lever (22) to its clutching position. Automatic feeding can now be made.  
**NOTE:** By changing the Change Lever (3) and Gear A, B, C, or D 12 different automatic feed selections can be made. (See Figure E.)



### CAUTION! RISK OF KICKBACK!

**Never attempt to adjust the Change Lever (3) while the machine is on or running. Attempting to adjust the Change Lever while the unit is running could result in PERSONAL INJURY and/or damage to the machine.**

| A |     | A    | 24    | 30     | 36    | 42     |
|---|-----|------|-------|--------|-------|--------|
|   | I   | mm   | 0.2   | 0.25   | 0.30  | 0.35   |
|   | II  | mm   | 0.1   | 0.125  | 0.15  | 0.175  |
|   | III | mm   | 0.05  | 0.063  | 0.075 | 0.088  |
|   | I   | INCH | 0.008 | 0.010  | 0.012 | 0.014  |
|   | II  | INCH | 0.004 | 0.005  | 0.006 | 0.007  |
|   | III | INCH | 0.002 | 0.0025 | 0.003 | 0.0035 |

**INCH LEADSCREW**

| A |     | A    | 24    | 30     | 36    | 42     |
|---|-----|------|-------|--------|-------|--------|
|   | I   | mm   | 0.2   | 0.25   | 0.30  | 0.35   |
|   | II  | mm   | 0.1   | 0.125  | 0.15  | 0.175  |
|   | III | mm   | 0.05  | 0.063  | 0.075 | 0.088  |
|   | I   | INCH | 0.008 | 0.010  | 0.012 | 0.014  |
|   | II  | INCH | 0.004 | 0.005  | 0.006 | 0.007  |
|   | III | INCH | 0.002 | 0.0025 | 0.003 | 0.0035 |

**METRIC LEADSCREW**

FIGURE E

## TOOL POST

1. The Tool Post (T734) implements click stops to help you find common angles. If you wish to use a different angle than the click stop angles, simply adjust the Tool Post (T734) to the desired angle.
2. While holding the Tool Post (T734) securely in the desired position, tighten the Handle (T738) to lock it into place.

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## CROSS FEEDING

1. *Hand feeding* can be accomplished by manually operating the Cross Feed Hand Wheel (20).
2. For *automatic feeding*, turn the Lead Screw Lever (1) to the left. Leave the Half Nut's Lever (22) in its original non-clutching position. Next, pull out the Cross Feed Clutch Lever (18). Automatic feeding can now be made.  
**NOTE:** By changing the Change Lever (3) and Gear A, B, C, or D 12 *different automatic feed selections* can be made.

## THREAD CUTTING

1. For a thread cutting operation, adjust the Main Spindle to its lowest speed. (See section "*The Main Spindle*" for instructions.)
2. Turn the Lead Screw Lever (1) to the left. Turn the Half Nut's Lever (22) to its clutching position. Thread cutting can now be made.  
**NOTE:** Different thread pitch (by inch or metric) can be made by changing the Change Lever (3, Figure B) and Gear A, B, C, or D. (See Figure F1 and page 13, figure F2.)



### CAUTION! RISK OF KICKBACK!

**Never attempt to adjust the Change Lever (3) while the machine is on or running. Attempting to adjust the Change Lever while the unit is running could result in PERSONAL INJURY and/or damage to the machine.**

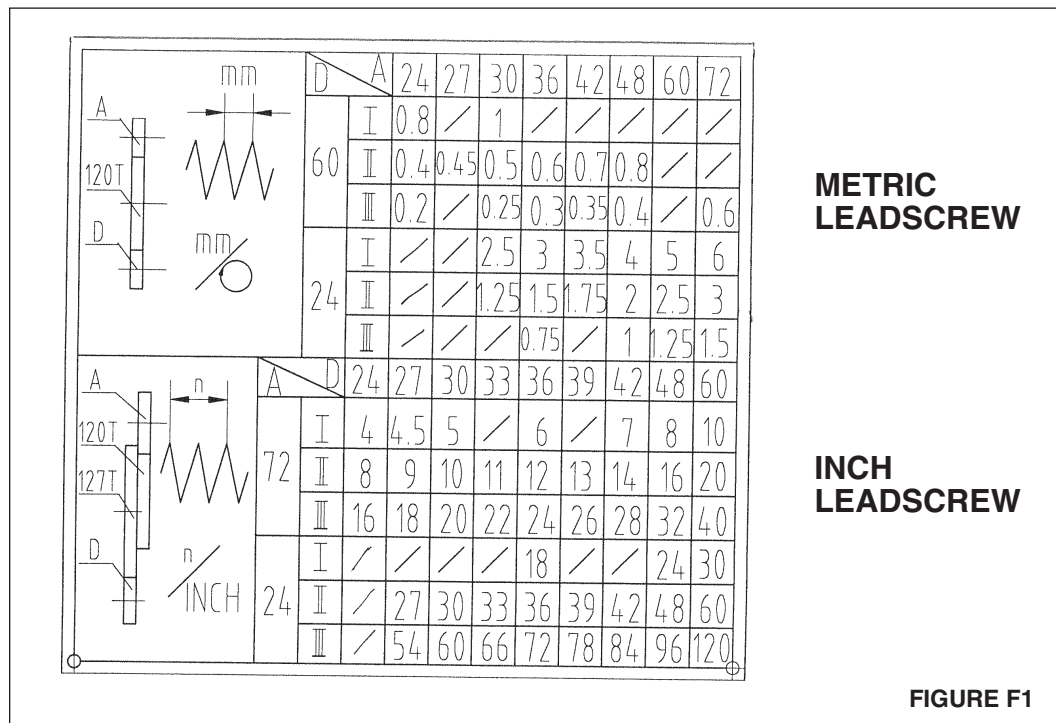


FIGURE F1

REV 12/05; 02/06

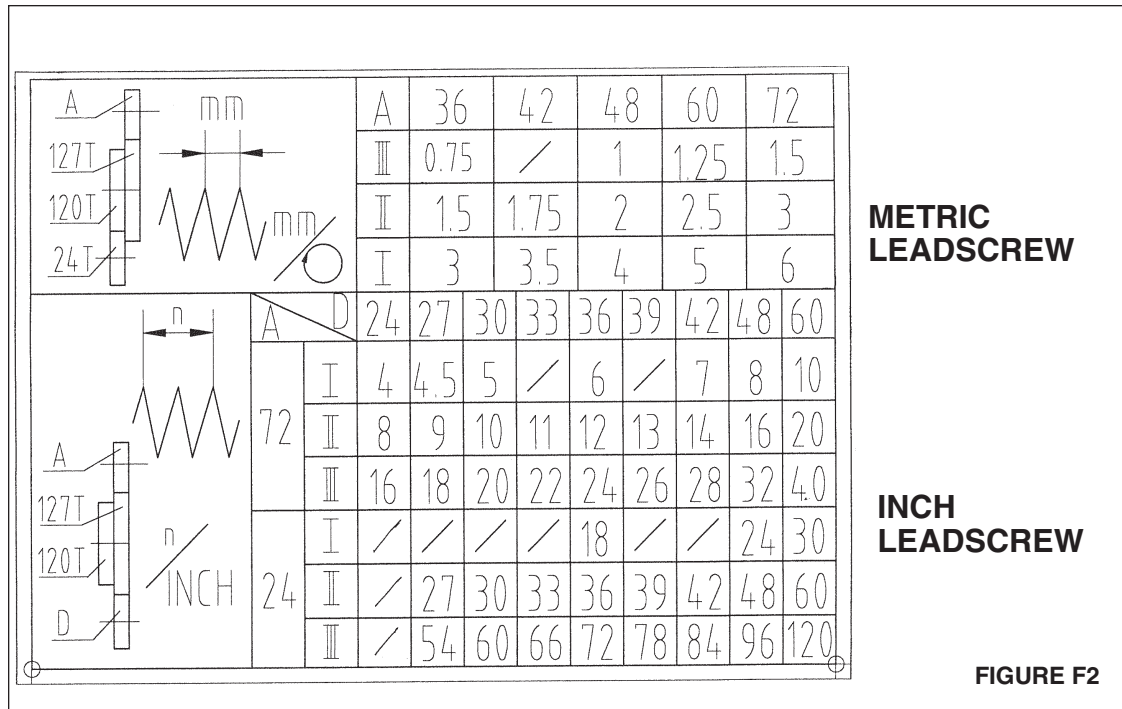


FIGURE F2

## THE THREAD DIAL

- The Thread Dial indicates the proper time to engage the Half Nut's Lever (22) so that the Half Nuts will enter the same groove of the thread on each successive cut.
- The Thread Dial is marked with revolving lines numbered 1. 2. 3. 4. 5. 6. Also, a single (fixed) line is marked on the Thread Dial.
- The chart (**See Figure G**) shows the selection available when matching the revolving lines with the fixed line.
- When thread cutting, engage the Half Nut's Lever (22) at the proper numbers shown on the *Scale* columns of the chart. 1-6 on the Scale columns mean the Half Nut's Lever (22) can be engaged on any of the revolving numbered lines 1. 2. 3. 4. 5. 6.
- NOTE:** In the first cutting, if you engage the Half Nut's Lever (22) and match the revolving numbered lines with the fixed line you must also engage the Half Nut's Lever (22) and match the revolving numbered lines with the fixed line for successive cuttings.
- NOTE:** You will not need to use the Thread Dial if the Half Nut's Lever (22) and the Lead Screw Lever (1) are both engaged throughout the process of cutting the thread. After finishing each successive cut, back off the cutting tool and reverse the Drilling/Milling Spindle. Then, move the cutting tool to the previous cutting start position, return the Drilling/Milling Spindle to its forward rotation, and make the next successive cut.

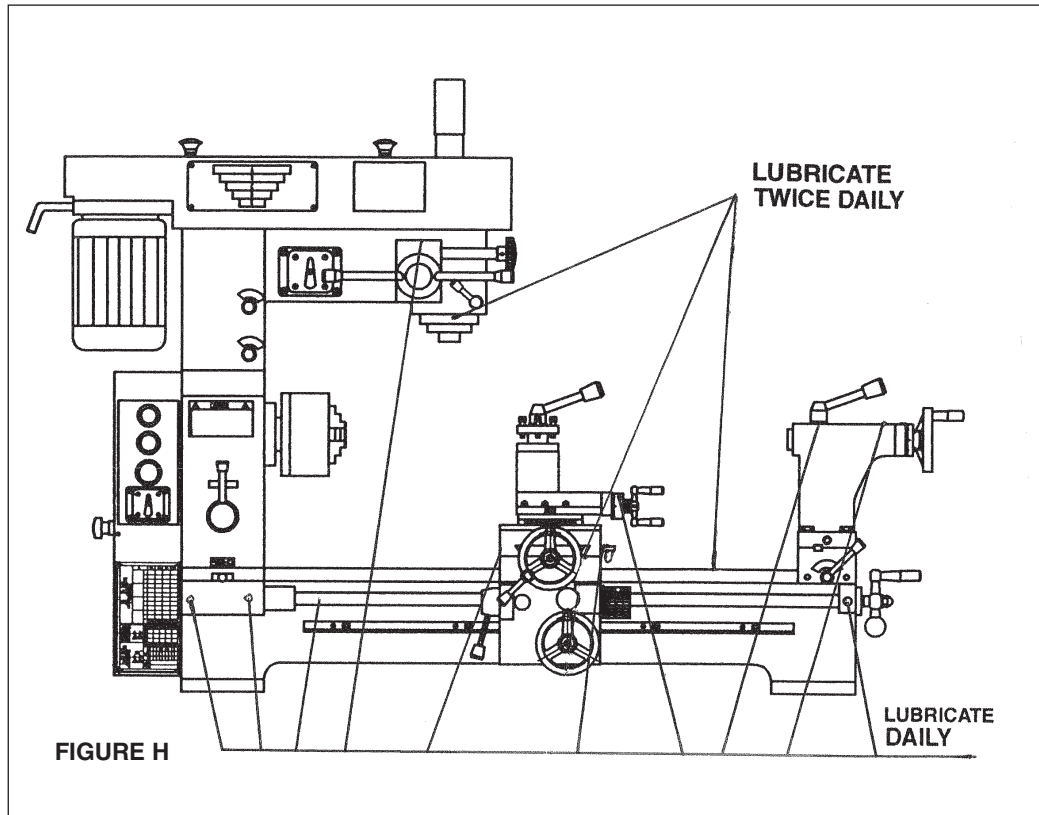
| INDICATOR TABLE |       |     |       |     |       |                 |       |
|-----------------|-------|-----|-------|-----|-------|-----------------|-------|
| TPI             | SCALE | TPI | SCALE | TPI | SCALE | TPI             | SCALE |
| 8               | 14    | 12  | 1-6   | 20  | 14    | 32              | 14    |
| 9               | 1-6   | 14  | 14    | 22  | 14    | 40              | 14    |
| 10              | 14    | 16  | 14    | 24  | 1-6   | <b>FIGURE G</b> |       |
| 11              | 14    | 18  | 1-6   | 28  | 14    |                 |       |

## CLEANING AND MAINTENANCE

1. *Caution:* Always disconnect this tool from its electrical power supply before performing any cleaning, servicing, or maintenance.
2. To clean, use only a mild detergent and damp cloth. Do not use a flammable or combustible solvent. Do not allow a liquid to flow inside the Machine. After cleaning, lubricate all moving parts of the Machine.
3. **If the Spindle Assembly has any play or slop in its movement, the Spanner Nut (568) may require tightening.** Loosen the Pan Phillips Screw (531) and remove the Cap (530) to access it. After securely hand-tightening the Spanner Nut (568), replace the Cap (530), and secure the Pan Phillips Screw (531).

## LUBRICATION

1. The Machine lubricating points should be lubricated (twice daily or daily) according to the chart. **(See Figure H)**
2. In addition, the Spindle Bearings should be lubricated with grease regularly and cleaned once a year.
3. The Gears in the Headstock should be lubricated with No. 70 or HL-70 gear oil follow the oil gauge when adding oil. The oil in the Headstock should be changed regularly; the first time after about 30 days, the second time after 45 days, and thereon once each year.
4. The Worm Gear and Half Nuts Bearings should be lubricated once a month to prevent wearing.



### **PLEASE READ THE FOLLOWING CAREFULLY**

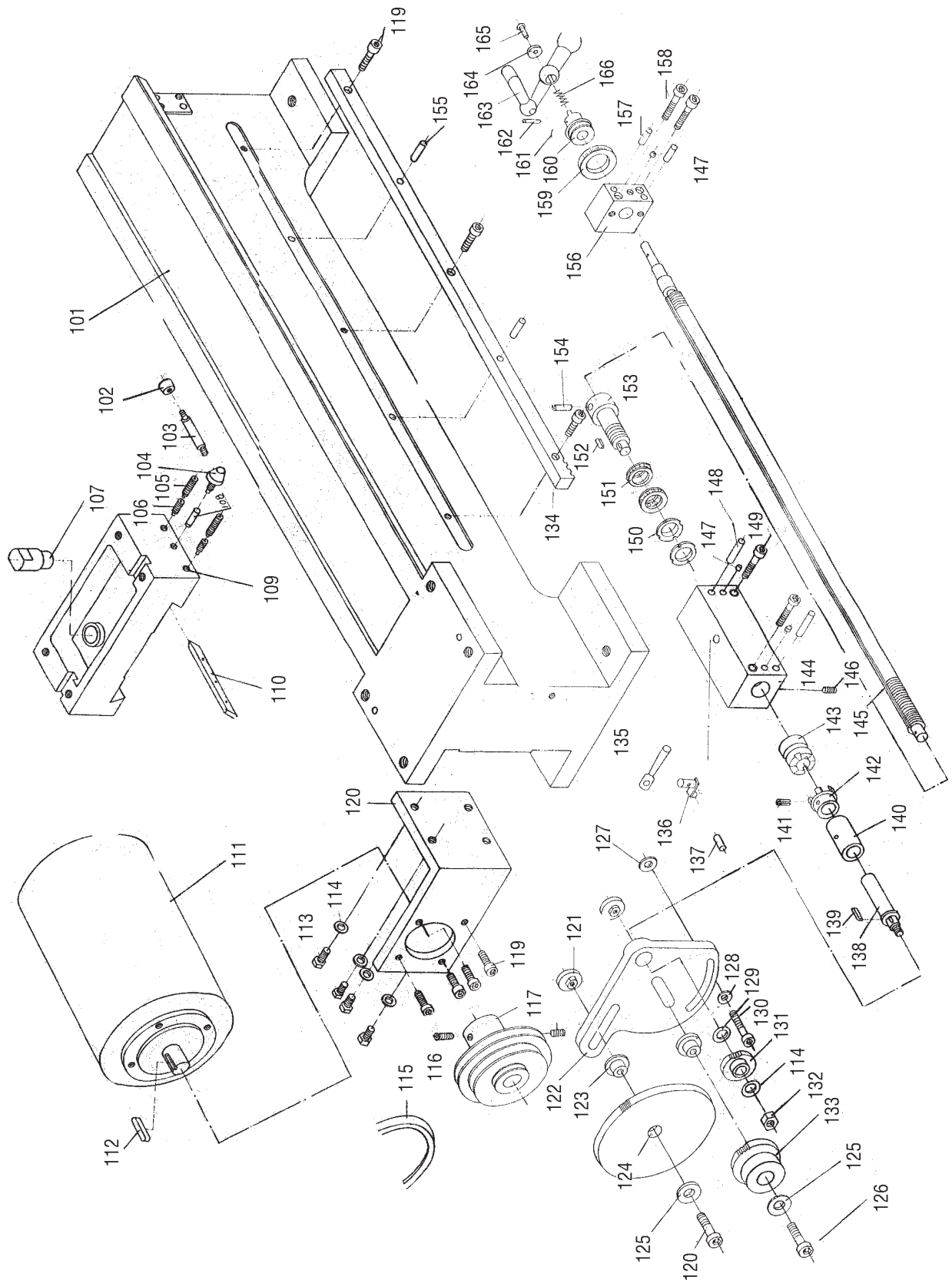
THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER NOR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

# PARTS LISTS AND DIAGRAMS

## BED ASSEMBLY PARTS LIST

| PART # | DESCRIPTION                 | PART # | DESCRIPTION                 |
|--------|-----------------------------|--------|-----------------------------|
| 101    | bed                         | 134    | rack                        |
| 102    | handle knob M6×20           | 135    | handle Aφ10×80              |
| 103    | handle                      | 136    | eccentric lever             |
| 104    | handle seat                 | 137    | roll pin φ3×20              |
| 105    | hex socket set screw M8×25  | 138    | transmission shaft          |
| 106    | set screw M8×14             | 139    | key A4×12                   |
| 107    | adjusting block             | 140    | sleeve                      |
| 108    | pin                         | 141    | roll pin φ5×22              |
| 109    | tailstock carriage          | 142    | clutch jaw A                |
| 110    | gib                         | 143    | clutch jaw B                |
| 111    | motor YCYS7144              | 144    | transmission box            |
| 112    | key A5×16                   | 145    | leadscrew                   |
| 113    | hex head bolt M10×25        | 146    | hex socket set screw M6×8   |
| 114    | washer φ16                  | 147    | oiler φ6                    |
| 115    | belt Z630                   | 148    | taper pin Bφ5×55            |
| 116    | set screw M8×8              | 149    | hex socket head screw M6×50 |
| 117    | pulley                      | 150    | spanner nut M17×1.5         |
| 118    | set screw M8×6              | 151    | ball bearing 8103φ17×φ30×9  |
| 119    | hex socket head screw M6×20 | 152    | key A5×12                   |
| 120    | motor mount                 | 153    | shaft connector             |
| 121    | T—nut                       | 154    | roll pin φ4×24              |
| 122    | bracket                     | 155    | roll pin φ5×30              |
| 123    | T—bushing                   | 156    | leadscrew seat              |
| 124    | gear                        | 157    | taper pin A φ6×55           |
| 125    | washer φ6                   | 158    | hex socket head screw M6×45 |
| 126    | hex socket head screw M6×40 | 159    | dial                        |
| 127    | washer φ6                   | 160    | dial seat                   |
| 128    | washer φ6                   | 161    | spring piece                |
| 129    | washer φ6                   | 162    | roll pin φ(4×20             |
| 130    | hex socket head screw M6×30 | 163    | crank handle                |
| 131    | gear                        | 164    | washer (4                   |
| 132    | hex nut M10                 | 165    | flat phillips screw M4×12   |
| 133    | gear                        | 166    | spring φ14×1×15             |

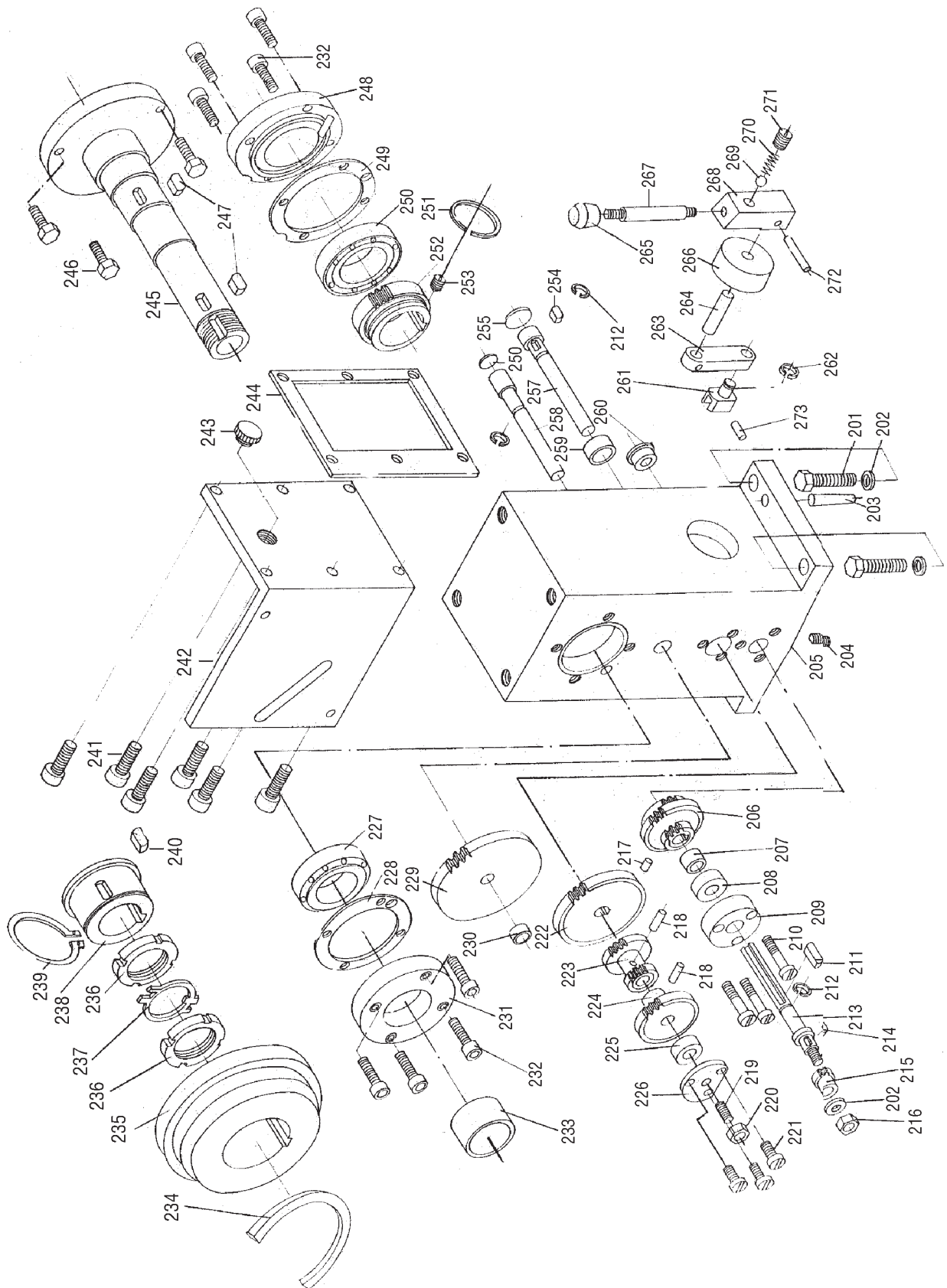
# BED ASSEMBLY DIAGRAM



## HEADSTOCK PARTS LIST

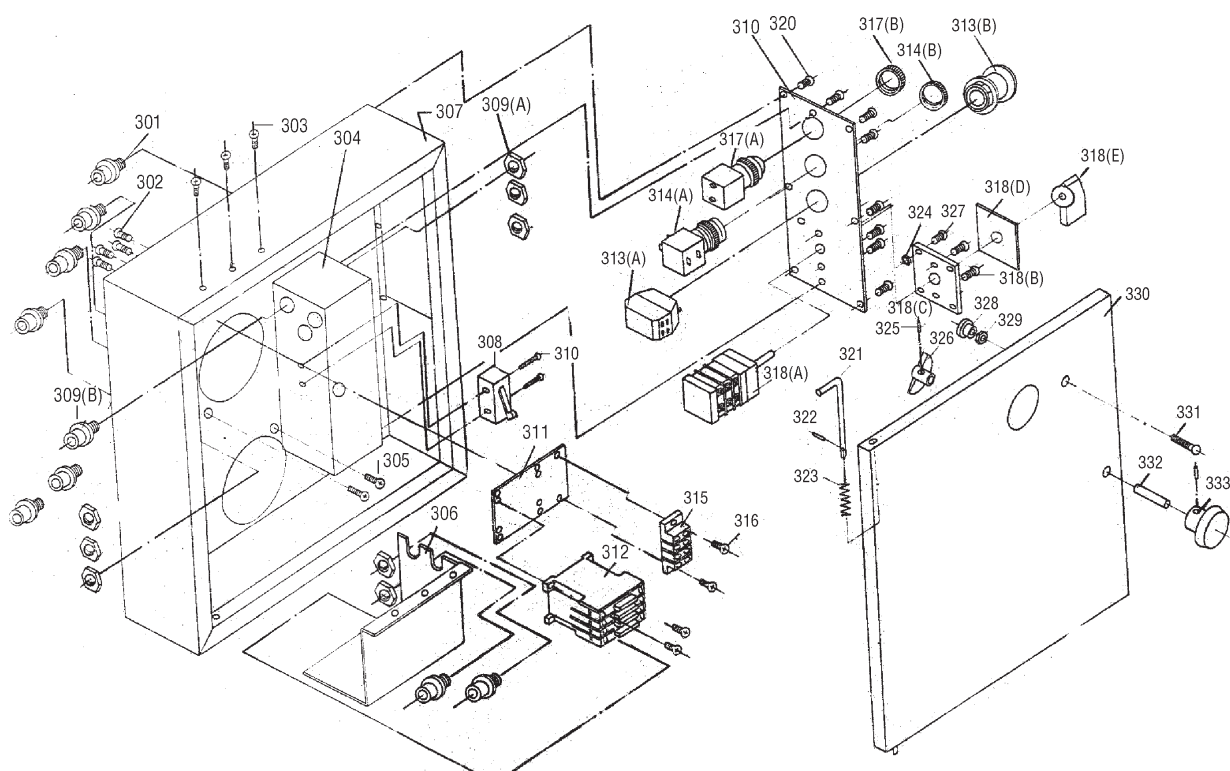
| PART # | DESCRIPTION                            | PART # | DESCRIPTION                             |
|--------|----------------------------------------|--------|-----------------------------------------|
| 201    | hex bolt M10×40                        | 238    | pulley spacer                           |
| 202    | washer(10                              | 239    | external snap ring φ63                  |
| 203    | taper pin(10×40                        | 240    | key 10×25                               |
| 204    | cone point set screw M5×12,socket head | 241    | hex socket cap screw M5×12              |
| 205    | headstock                              | 242    | bracing plate                           |
| 206    | triplex gear                           | 243    | oil plug                                |
| 207    | brass bushing                          | 244    | O ring                                  |
| 208    | O ring PD15×30×10                      | 245    | spindle                                 |
| 209    | O ring seat                            | 246    | hex head bolt M8×25                     |
| 210    | fillister slotted screw M5×12          | 247    | key 8×22                                |
| 211    | key 5×25                               | 248    | flange                                  |
| 212    | spacer(14                              | 249    | gasket(right)                           |
| 213    | shaft D                                | 250    | taper roller bearing 2007109 φ45 φ75×19 |
| 214    | key 4×10                               | 251    | locking ring                            |
| 215    | gear                                   | 252    | gear A                                  |
| 216    | hex nut M10                            | 253    | cone point set screw M8×10              |
| 217    | roll pin(3×8                           | 254    | key 5×14                                |
| 218    | roll pin(4×20                          | 255    | hole plug                               |
| 219    | flat point set screw M5×20             | 256    | hole plug                               |
| 220    | hex nut M5                             | 257    | shaft C                                 |
| 221    | pan head screw M5×12                   | 258    | shaft B                                 |
| 222    | gear C                                 | 259    | brass bushing                           |
| 223    | gear C(2)                              | 260    | oil glass                               |
| 224    | gear C(1)                              | 261    | fork                                    |
| 225    | brass bushing                          | 262    | spacer(12                               |
| 226    | cover                                  | 263    | fork arm                                |
| 227    | taper roller bearing 2007108(40×(68×18 | 264    | straight pin(B12×45                     |
| 228    | gasket(left)                           | 265    | handle knob M10×32                      |
| 229    | duplex gear(B)                         | 266    | spacer                                  |
| 230    | brass bushing                          | 267    | handle                                  |
| 231    | cover(left)                            | 268    | handle seat                             |
| 232    | hex socket head cap screw M5×6         | 269    | steel ball φ6.5                         |
| 233    | spacer                                 | 270    | spring φ5×0.8×15                        |
| 234    | V—belt Z710                            | 271    | flat point set screw M8×5               |
| 235    | pulley                                 | 272    | roll pin φ4×25                          |
| 236    | spanner nut M40×1.5                    | 273    | roll pin φ5×18                          |
| 237    | locking washer φ40                     |        |                                         |

# HEADSTOCK DIAGRAM



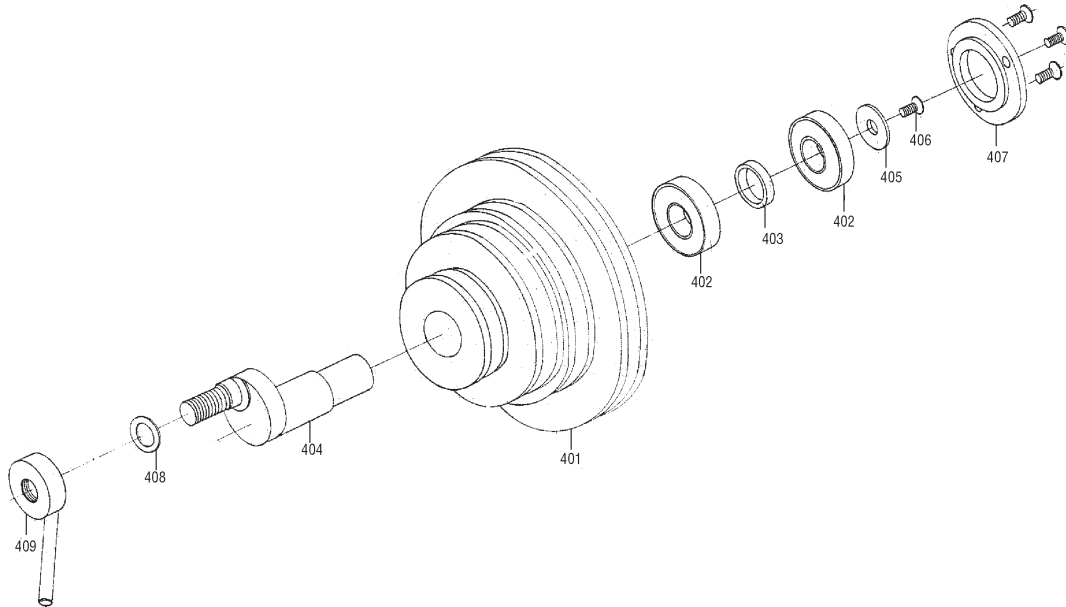
## CONTROL PANEL PARTS LIST & DIAGRAM

| PART # | DESCRIPTION                     | PART # | DESCRIPTION              |
|--------|---------------------------------|--------|--------------------------|
| 305    | hex socket head cap screw M6×10 | 322    | straight pin φA2×12      |
| 306    | electric housing                | 323    | spring 9×0.8×50          |
| 307    | pulley box                      | 324    | hex nut M4               |
| 308    | micro switch LX5—11N            | 325    | roll pin φ3×14           |
| 309    | connection tube                 | 326    | latch piece              |
| 310    | pan slotted screw M4×25         | 327    | flat head phillips M4×16 |
| 311    | electrical panel                | 328    | micro switch lever       |
| 312    | relay B16                       | 329    | hex nut M5               |
| 313A   | killoff switch LAY3             | 330    | door                     |
| 314A   | start switch LA19               | 331    | round head screw M5×35   |
| 315    | wire block                      | 332    | stud                     |
| 316    | pan phillips screw M4×10        | 333    | knob A8×32               |
| 317    | light indicator AD11            | 318D   | on—off plate             |
| 318    | on—off switch H25—10            | 318E   | switch knob              |
| 319    | electrical plate                | 318C   | switch seat              |
| 320    | pan phillips screw M4×10        | 318B   | flat head screw M3×15    |
| 321    | pivot                           | 318F   | pan head screw M2×12     |



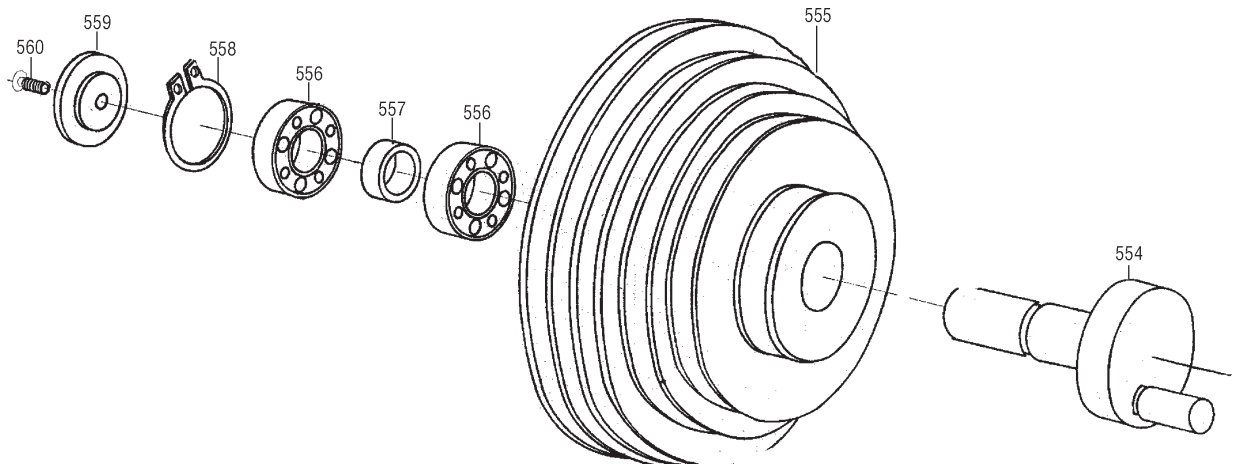
## IDLER PULLEY A PARTS LIST & DIAGRAM

| PART # | DESCRIPTION                | PART # | DESCRIPTION              |
|--------|----------------------------|--------|--------------------------|
| 401    | idle pulley                | 406    | flat slotted screw M5×10 |
| 402    | ball bearing 104φ20×φ42×12 | 407    | cover                    |
| 403    | spacer                     | 408    | washer φ12               |
| 404    | shaft                      | 409    | handle                   |
| 405    | washer                     |        |                          |



## IDLER PULLEY B PARTS LIST & DIAGRAM

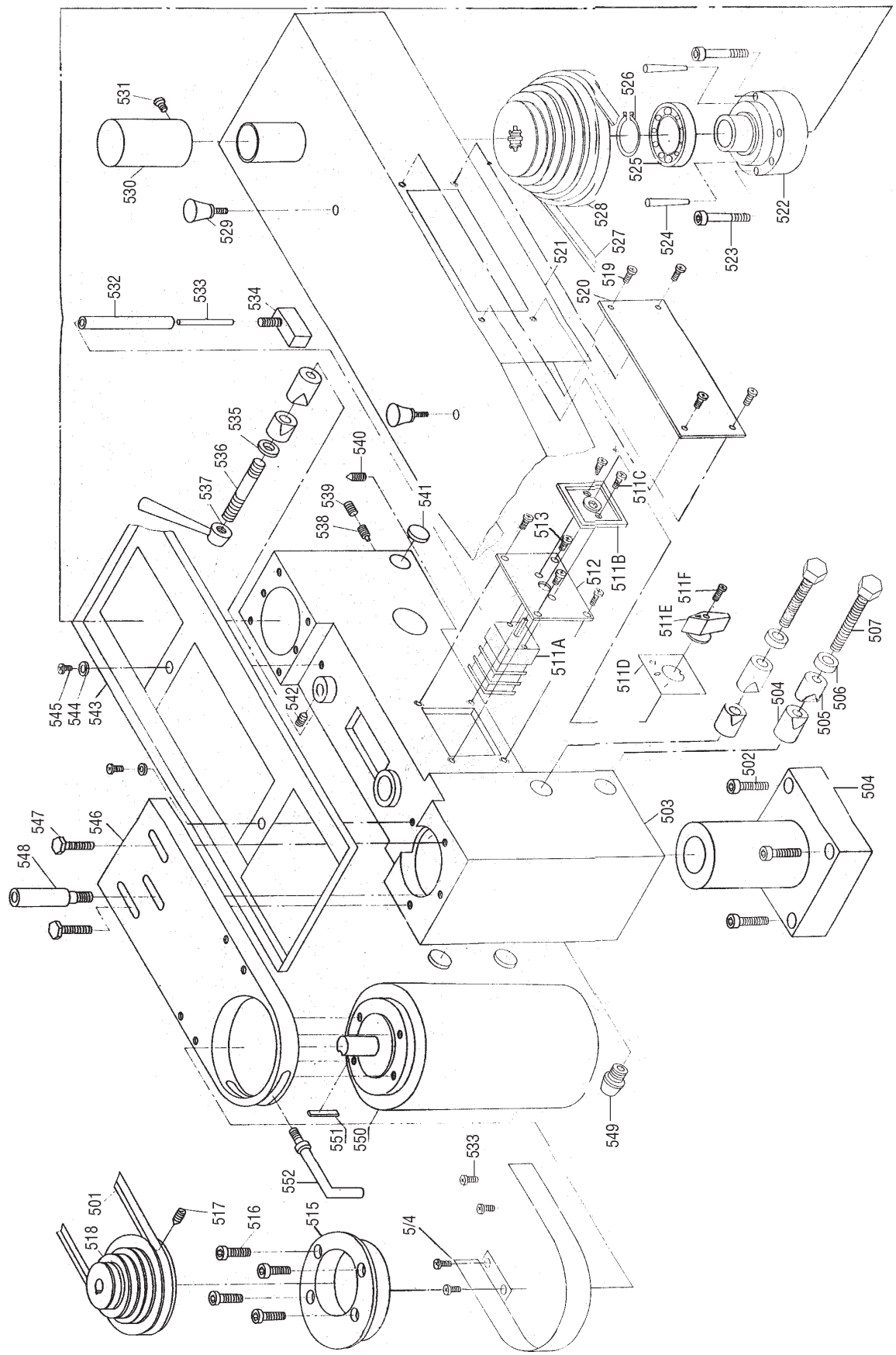
| PART # | DESCRIPTION                | PART # | DESCRIPTION            |
|--------|----------------------------|--------|------------------------|
| 554    | eccentric shaft            | 558    | external snap ring φ42 |
| 555    | idle pulley                | 559    | bearing cover          |
| 556    | ball bearing 104φ20×φ42×12 | 560    | flat head screw M5×10  |
| 557    | spacer                     |        |                        |



## DRILL/MILL HEAD ASSEMBLY PARTS LIST

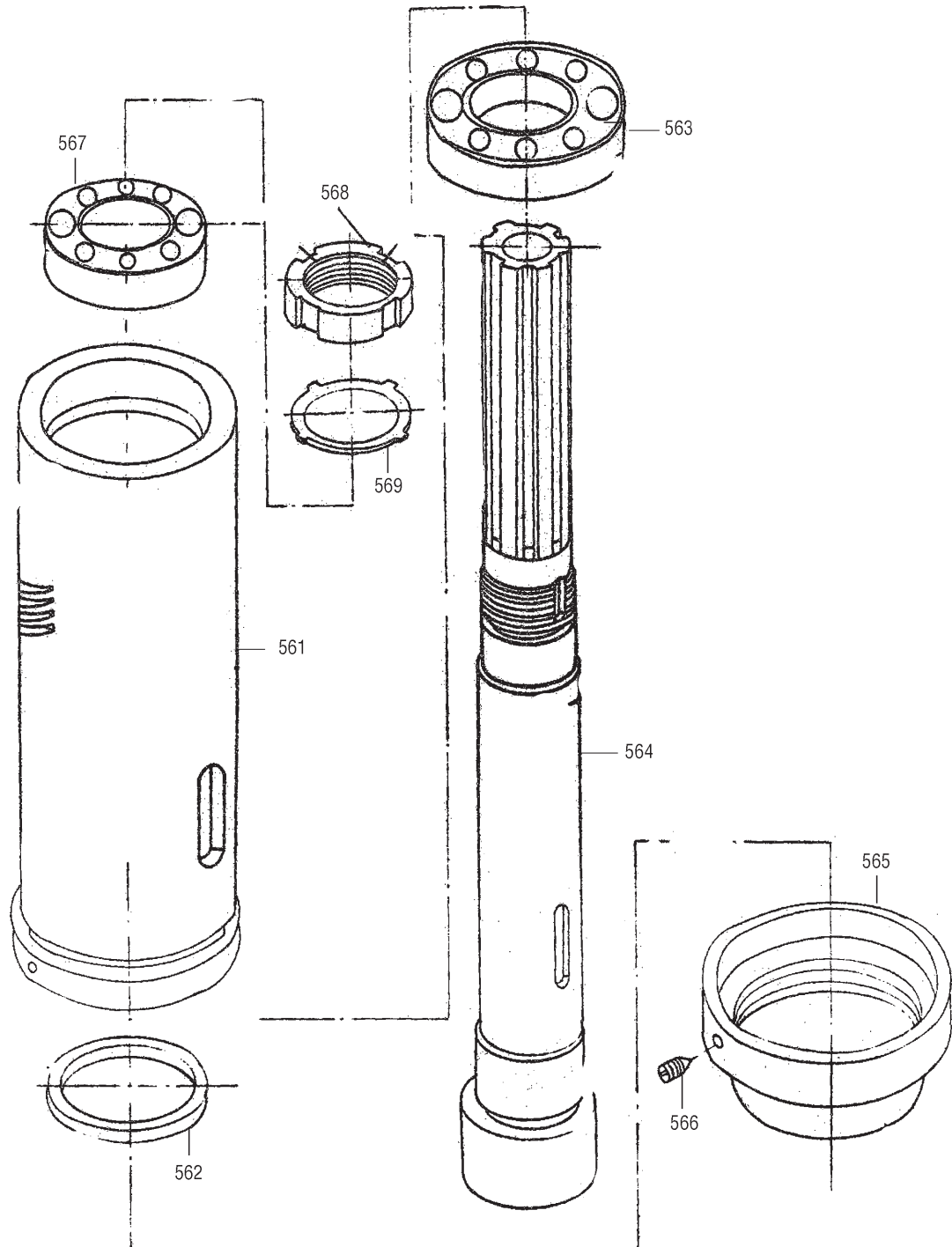
| PART # | DESCRIPTION                      | PART # | DESCRIPTION                     |
|--------|----------------------------------|--------|---------------------------------|
| 501    | V—belt Z800                      | 527    | V—belt Z860                     |
| 502    | hex socket head cap screw M10×40 | 528    | mill—drill pulley               |
| 503    | mill—drill head                  | 529    | knob CM8×25                     |
| 504    | mill—drill head support column   | 530    | cap                             |
| 505    | brake pad(pair)                  | 531    | pan nhillips screw M5×10        |
| 506    | brake spacer                     | 532    | mill—drill cover post           |
| 507    | bolt AM10×80                     | 533    | post insert                     |
| 511A   | switch,mill motor                | 534    | micro switch LX5—11H            |
| 511B   | switch seat                      | 535    | brake spacer                    |
| 511C   | flat head screw M3×15            | 536    | stud AM10×60                    |
| 511D   | on—off switch plate              | 537    | handle BM10×80                  |
| 511E   | on—off switch                    | 538    | dog point set screw M8×14       |
| 511F   | pan head screw M2×12             | 539    | flat point set screw M8×12      |
| 512    | switch plate                     | 540    | cone point set screw M8×20      |
| 513    | flat slotted screw M5×8          | 541    | hole plug                       |
| 514    | frame cover                      | 542    | cone point set screw M8×12      |
| 515    | eccentric flange                 | 543    | mill—drill cover(lower)         |
| 516    | hex socket head cap screw M6×20  | 544    | washer φ6                       |
| 517    | cone point set screw M8×12       | 545    | pan head screw M6×12            |
| 518    | motor pulley                     | 546    | motor mount                     |
| 519    | pan phillips screw M4×6          | 547    | hex head bolt M10×30            |
| 520    | see—through window               | 548    | mill—drill cover post           |
| 521    | mill—drill cover(upper)          | 549    | connectoin tube(M162pcs,M181pc) |
| 522    | pulley seat flange               | 550    | motor(same as #111)             |
| 523    | hex socket head cap screw M6×40  | 551    | key A5×16                       |
| 524    | taper pin φA5×45                 | 552    | tension handle                  |
| 525    | ball bearing 108φ40×φ68×15       | 553    | pan head screw M6×20            |
| 526    | external snap ring φ40           |        |                                 |

# DRILL/MILL HEAD ASSEMBLY DIAGRAM



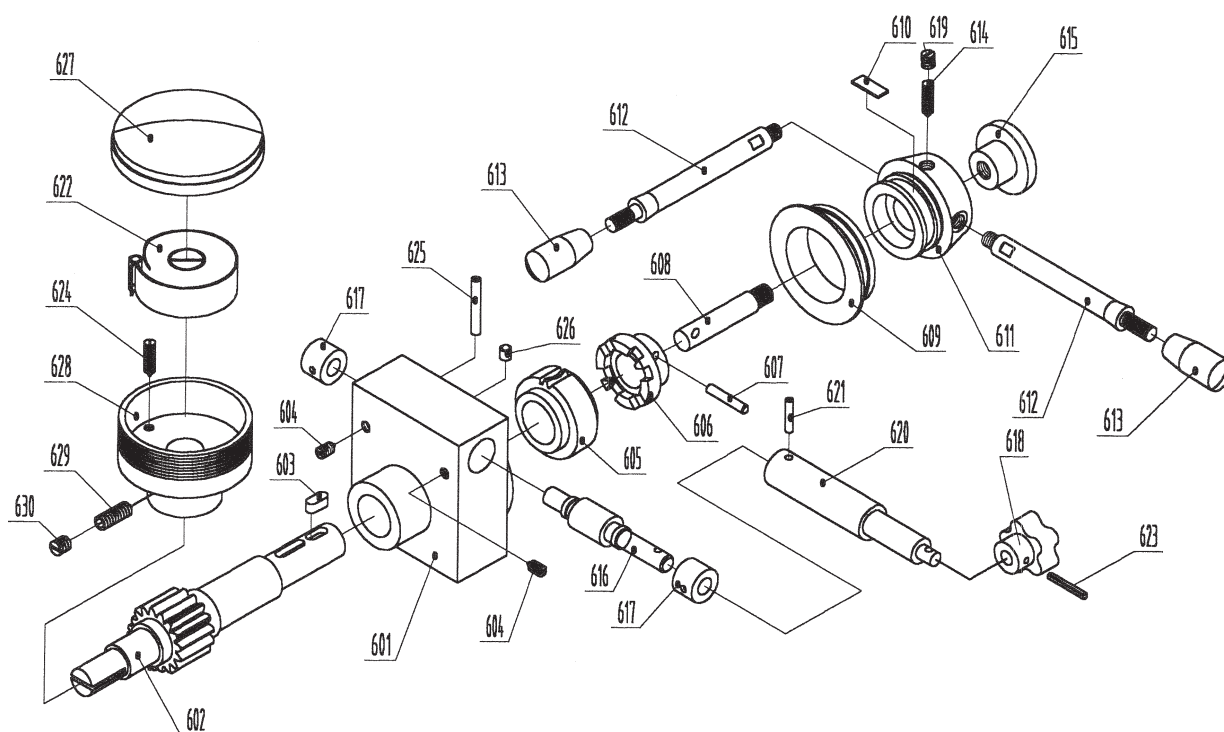
## SPINDLE ASSEMBLY PARTS LIST & DIAGRAM

| PART # | DESCRIPTION                    | PART # | DESCRIPTION               |
|--------|--------------------------------|--------|---------------------------|
| 561    | quill                          | 566    | cone point set screw M5×6 |
| 562    | gasket                         | 567    | bearing 2007106φ30×φ55×16 |
| 563    | ball bearing 2007107φ35×φ62×17 | 568    | spanner nut M30×1.5       |
| 564    | spline spindle                 | 569    | washer φ30                |
| 565    | cover                          |        |                           |



## SPINDLE FEED ASSEMBLY PARTS LIST & DIAGRAM

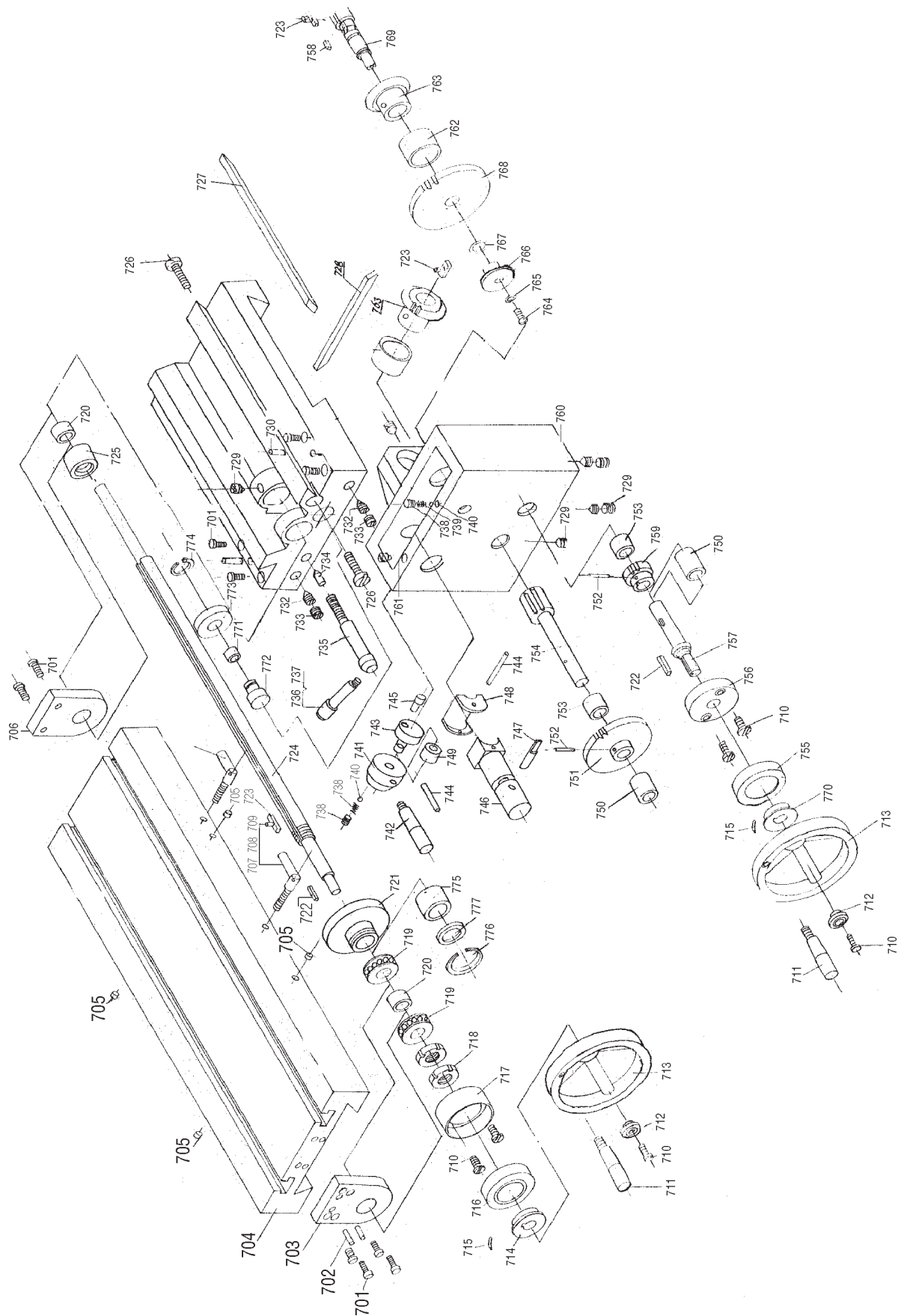
| PART # | DESCRIPTION                   | PART # | DESCRIPTION                 |
|--------|-------------------------------|--------|-----------------------------|
| 601    | quill feeding box             | 615    | knurled knob BM10×40        |
| 602    | gear shaft                    | 616    | worm                        |
| 603    | key 6×14                      | 617    | dial seat                   |
| 604    | cone pointset screw M6×8      | 618    | spring                      |
| 605    | worm gear                     | 619    | screw M5×25                 |
| 606    | clutch jaw                    | 620    | worm shaft                  |
| 607    | taper pin $\varnothing$ D5×28 | 621    | roll pin $\varnothing$ 4×20 |
| 608    | stud                          | 622    | crank                       |
| 609    | dial                          | 623    | roll pin $\varnothing$ 4×14 |
| 610    | spring piece                  | 624    | handle M8×40                |
| 611    | dial seat                     | 625    | roll pin $\varnothing$ 5×35 |
| 612    | handle                        | 626    | oiler $\varnothing$ 6       |
| 613    | handle knob BM8×40            | 627    | spring housing cover        |
| 614    | cone point set screw M6×18    | 628    | spring housing              |



## MILLING TABLE & APRON PARTS LIST

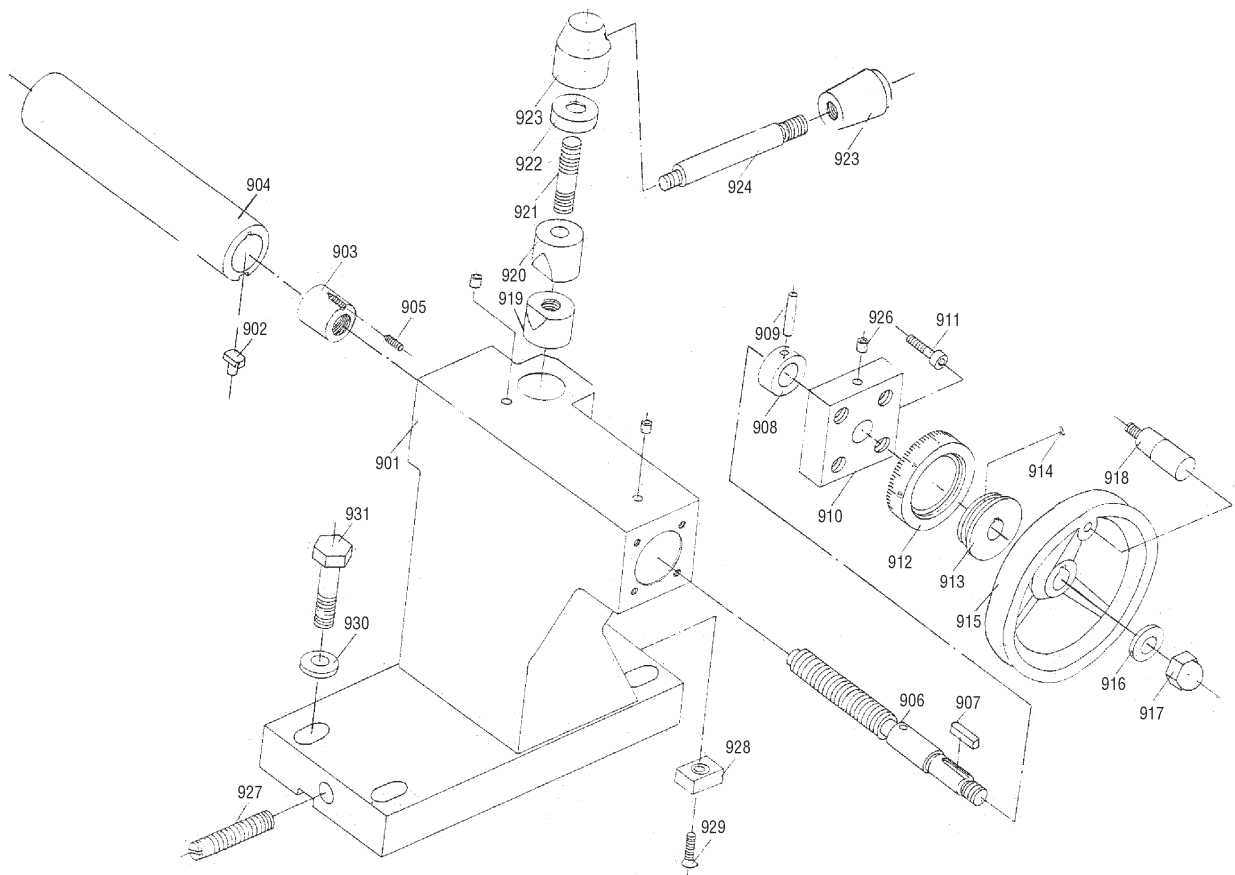
| PART # | DESCRIPTION                                         | PART # | DESCRIPTION                |
|--------|-----------------------------------------------------|--------|----------------------------|
| 701    | hex socket head cap screw M6×20                     | 740    | steel ball $\phi 6.3$      |
| 702    | straight pin A $\phi 5 \times 25$                   | 741    | handle seat                |
| 703    | trestle B                                           | 742    | handle BM6×                |
| 704    | table                                               | 743    | eccentric wheel            |
| 705    | oilet $\phi 6$                                      | 744    | roll pin $\phi 4 \times$   |
| 706    | trestle A                                           | 745    | arm                        |
| 707    | locking screw                                       | 746    | half nut seat              |
| 708    | locking lever                                       | 747    | stop pin                   |
| 709    | roll pin $\phi 2 \times 10$                         | 748    | half nut                   |
| 710    | hex head bolt M4×12                                 | 749    | spacer E                   |
| 711    | handle M6×50                                        | 750    | spacer B                   |
| 712    | washer                                              | 751    | gear                       |
| 713    | handwheel B12×100                                   | 752    | roll pin $\phi 4 \times 2$ |
| 714    | dial seat A                                         | 753    | spacer C                   |
| 715    | spring piece                                        | 754    | shaft pinion               |
| 716    | dial                                                | 755    | dial                       |
| 717    | fixing sleeve A                                     | 756    | fixing sleeve B            |
| 718    | spanner nut M14×1.5                                 | 757    | shaft                      |
| 719    | ball bearing 8102 $\phi 15 \times \phi 28 \times 9$ | 758    | key 5×8                    |
| 720    | spacer A                                            | 759    | gear                       |
| 721    | gear                                                | 760    | apron                      |
| 722    | key 4×18                                            | 761    | cone point set s           |
| 723    | T—key                                               | 762    | spacer D                   |
| 724    | cross feed screw                                    | 763    | bevel gear                 |
| 725    | cross feed nut                                      | 764    | pan phillips ser           |
| 726    | adjust screw                                        | 765    | washer $\phi 6$            |
| 727    | table gib                                           | 766    | pull-push knob             |
| 728    | carriage gib                                        | 767    | washer $\phi 12$           |
| 729    | cone point set screw M6×8                           | 768    | gear                       |
| 730    | taper pin 5×25                                      | 769    | shaft                      |
| 731    | carriage                                            | 770    | dial seat B                |
| 732    | cone point set screw M8×16                          | 771    | brass bushing              |
| 733    | flat point set screw M8×12                          | 772    | shaft                      |
| 734    | pin                                                 | 773    | gear                       |
| 735    | locking stud                                        | 774    | spacer 12                  |
| 736    | handle knob M6×20                                   | 775    | brass bushing              |
| 737    | handle M6×32                                        | 776    | spacer 26                  |
| 738    | flat point set screw M8×8                           | 777    | washer                     |
| 739    | spring $\phi 6$                                     |        |                            |

# MILLING TABLE & APRON DIAGRAM



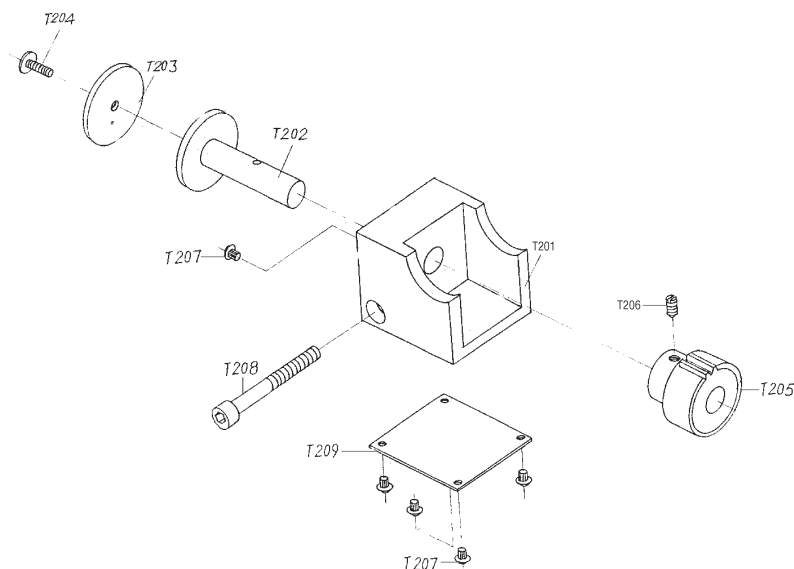
## TAILSTOCK ASSEMBLY PARTS LIST & DIAGRAM

| PART # | DESCRIPTION                 | PART # | DESCRIPTION          |
|--------|-----------------------------|--------|----------------------|
| 901    | tailstock                   | 917    | acorn nut M10        |
| 902    | T-key                       | 918    | handle M6×50         |
| 903    | tailstock nut               | 919    | locking pad (lower)  |
| 904    | tailstock barrel            | 920    | locking pad (upper)  |
| 905    | set screw M4×8              | 921    | stud AM10×40         |
| 906    | tailstock screw             | 922    | locking spacer       |
| 907    | key C4×18                   | 923    | handle seat          |
| 908    | spacer                      | 924    | handle               |
| 909    | straight pin D φ5×8         | 925    | handle knob M10×32   |
| 910    | nut seat                    | 926    | oiler φ6             |
| 911    | hex socket head screw M5×20 | 927    | set screw M10×50     |
| 912    | dial                        | 928    | key                  |
| 913    | dial seat                   | 929    | set screw M5×12      |
| 914    | spring piece                | 930    | washer φ10           |
| 915    | handwheel B12×100           | 931    | hex head bolt M10×40 |
| 916    | washer φ10                  |        |                      |



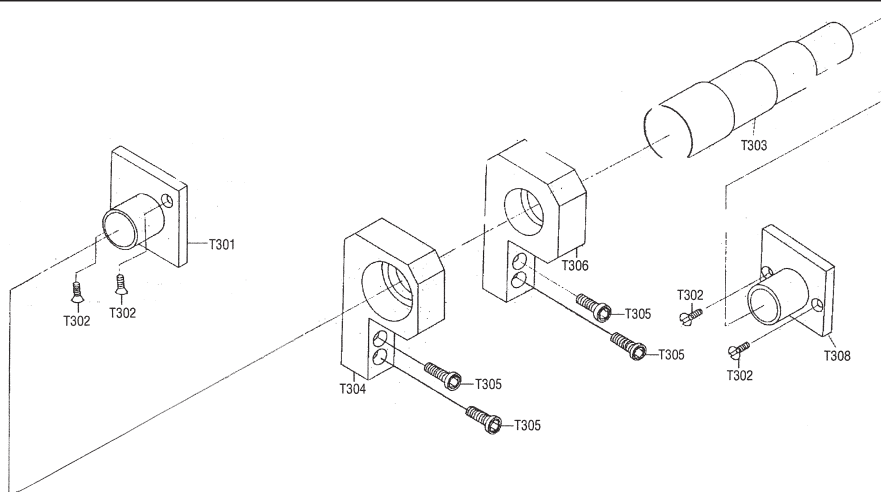
## THREADING DIAL ASSEMBLY PARTS LIST & DIAGRAM

| PART # | DESCRIPTION              | PART # | DESCRIPTION                    |
|--------|--------------------------|--------|--------------------------------|
| T201   | threading dial seat      | T206   | set screw M5×8                 |
| T202   | shaft                    | T207   | rivet $\varnothing 2 \times 4$ |
| T203   | indicator plate          | T208   | hex socket head screw M6×11    |
| T204   | pan phillips screw M4×12 | T209   | threading dial plate           |
| T205   | gear                     |        |                                |



## LEADSCREW COVER ASSEMBLY PARTS LIST & DIAGRAM

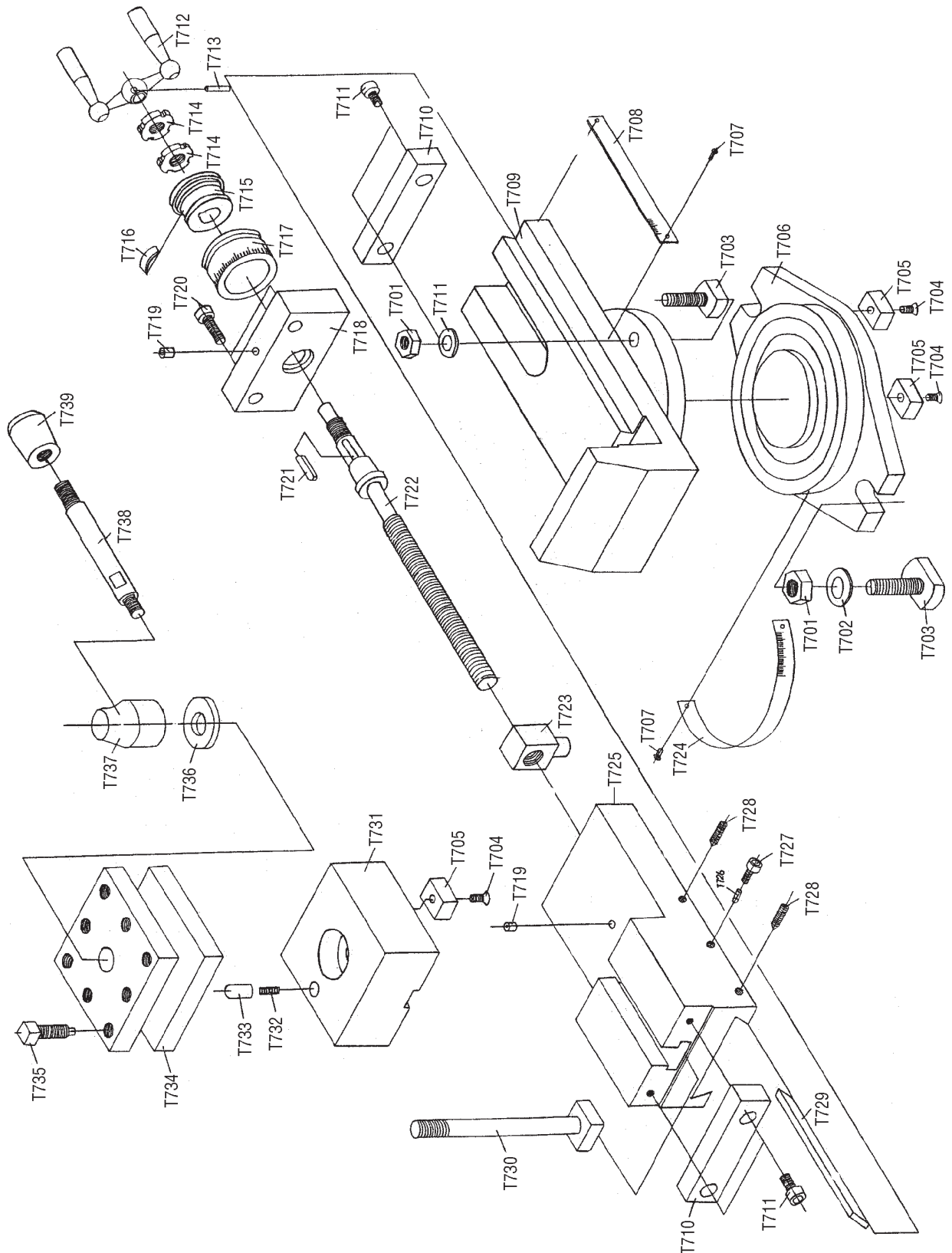
| PART # | DESCRIPTION              | PART # | DESCRIPTION                 |
|--------|--------------------------|--------|-----------------------------|
| T301   | cover mount (left)       | T305   | hex socket head screw M6×11 |
| T302   | flat slotted screw M4×10 | T306   | cover seat (right)          |
| T303   | leadcrew cover (left)    | T307   | cover mount (right)         |
| T304   | cover seat (left)        |        |                             |



## TOOL SLIDE & POST ASSEMBLY PARTS LIST

| PART # | DESCRIPTION            | PART # | DESCRIPTION                          |
|--------|------------------------|--------|--------------------------------------|
| T701   | nut M10                | T721   | pin                                  |
| T702   | washer 10              | T722   | screw TR12                           |
| T703   | T—belt M10×30          | T723   | nut TR12                             |
| T704   | screw M4×12            | T724   | angle rule                           |
| T705   | key                    | T725   | mobile jaw                           |
| T706   | base                   | T726   | set pin                              |
| T707   | screw                  | T727   | hex socket head<br>screw (M5×8       |
| T708   | rubber                 |        |                                      |
| T709   | vise                   | T728   | set screw                            |
| T710   | jaw washer             | T729   | gib                                  |
| T711   | hex socket head screw  | T730   | bolt M10×100                         |
| T712   | handle B8×25           | T731   | tool base                            |
| T713   | pin $\phi 3 \times 16$ | T732   | spring $\phi 5 \times 0.6 \times 30$ |
| T714   | nut M10×1              | T733   | positioner                           |
| T715   | dial seat              | T734   | tool post                            |
| T716   | spring piece           | T735   | screw M8×25                          |
| T717   | dial                   | T736   | set washer                           |
| T718   | screw seat             | T737   | nut M10                              |
| T719   | oiler                  | T738   | handle                               |
| T720   | screw                  | T739   | handle knob M10×32                   |

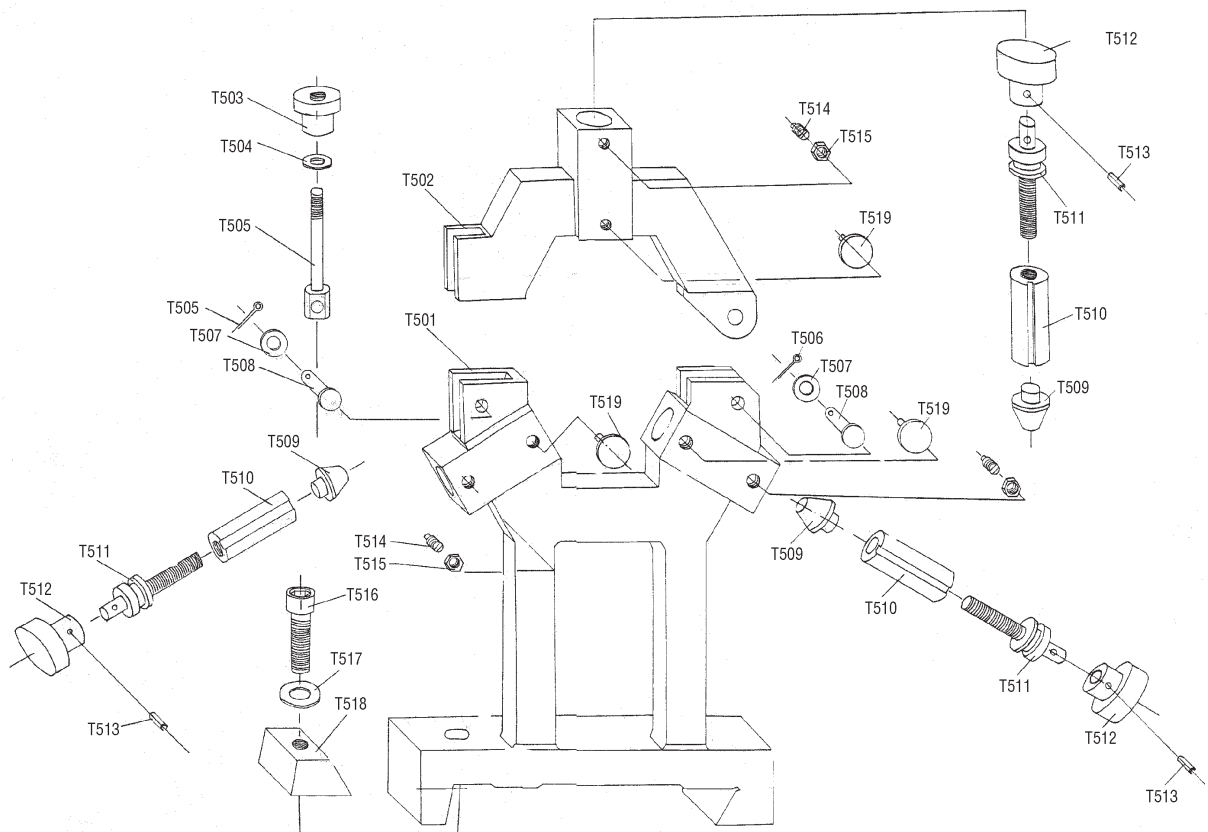
# TOOL SLIDE & POST ASSEMBLY DIAGRAM



## PARTS LISTS & DIAGRAMS FOR OPTIONAL PARTS

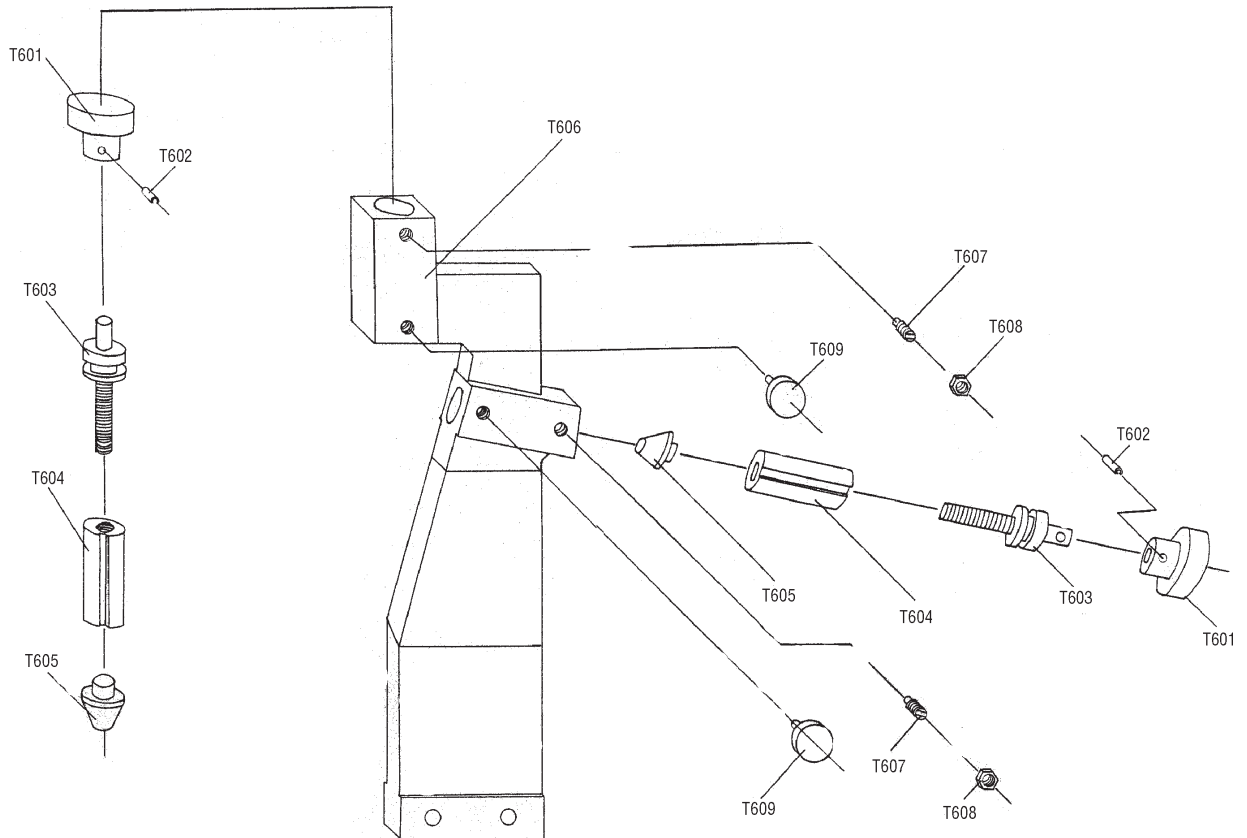
### STEADY REST ASSEMBLY (NOT INCLUDED)

| PART # | DESCRIPTION                       |
|--------|-----------------------------------|
| T501   | steady rest center frame          |
| T502   | steady rest center frame head     |
| T503   | small knob                        |
| T504   | washer(8                          |
| T505   | locking bolt                      |
| T506   | cotter pin(6×20                   |
| T507   | washer(6                          |
| T508   | locking pin                       |
| T509   | brass head                        |
| T510   | finger sleeve                     |
| T511   | adjusting bolt                    |
| T512   | large knob                        |
| T513   | roll pin(3×16                     |
| T514   | slotted set screw,dog point,M6×16 |
| T515   | hex nut M6                        |
| T516   | hex socket head screw M10×35      |
| T517   | washer(10                         |
| T518   | chock                             |
| T519   | knurled screw                     |



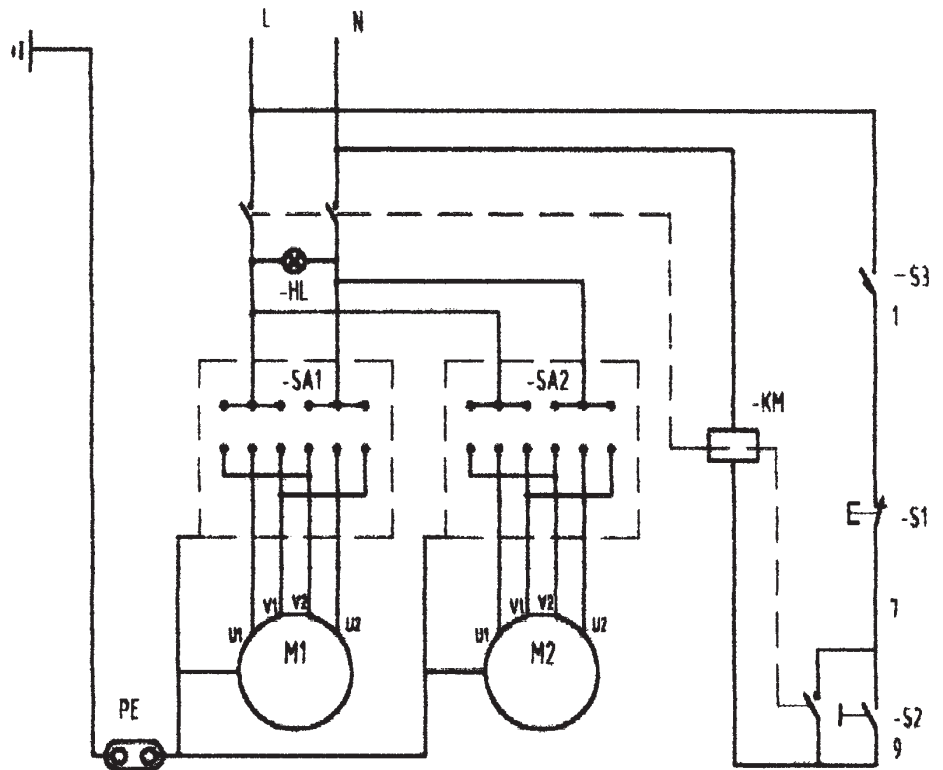
## FOLLOW REST ASSEMBLY (NOT INCLUDED)

| PART # | DESCRIPTION       |
|--------|-------------------|
| T601   | large knob        |
| T602   | roll pin M3×16    |
| T603   | adjusting bolt    |
| T604   | finger sleeve     |
| T605   | brass head        |
| T606   | follow rest frame |

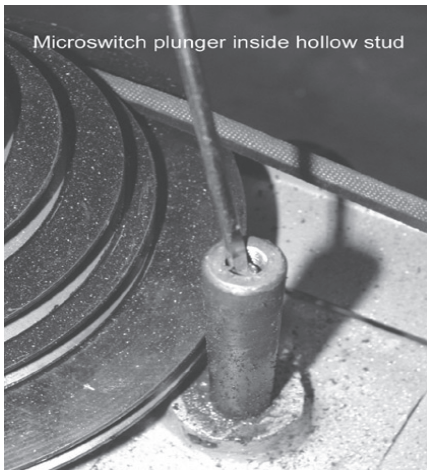


**NOTE:** Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

## WIRING DIAGRAM



| Direction<br>Terminal | Direction         |     |           |
|-----------------------|-------------------|-----|-----------|
|                       | Counter-clockwise | Off | Clockwise |
| L-U1                  | X                 | -   | X         |
| N-U2                  | X                 | -   | X         |
| L-V1                  | X                 | -   | -         |
| N-V2                  | X                 | -   | -         |
| L-V2                  | -                 | -   | X         |
| N-V1                  | -                 | -   | X         |



**NOTE:** There is a micro switch (534) on the parts list on page 17 and shown on the illustration on page 26, that is attached to the mill-drill head (503) on page 17. The Micro switch has an extension connected to it (532). When the mill-drill cover (521) is closed, the mill-drill post (532) is depressed and the micro switch completes the circuit allowing the machine to be turned on. On the electrical schematic above it is indicated as S1.

REV 11/05 REV 09/05